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ABSTRACT

Human population growth and the implications of increasing population on the well-being of men and nations is examined in this twelfth grade curriculum guide which is part of a series for grades 4 through 12. The primary functions of the unit are to introduce the student to reasons for population growth, results of overextended populations, and solutions to overpopulation. Consideration is also given to political and sociological problems which arise as adjuncts to the question of population. The component parts of this guide are: an overview of the unit, the major concepts in the unit, behavioral objectives, daily schedule, lesson plans for classroom activities, a pretest for the unit, and student and teacher evaluation forms. The unit requires three weeks to complete, and is structured around 15 student-centered activities which include films, survey questionnaires, filmstrips, student readings, discussion activities, data analysis, and role playing. (Author/DE)

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LITTLE ROCK ENVIRONMENTAL EDUCATION PROJECT

"A Multidisciplinary and Direct Experience Approach to Teaching Environmental Education"

The Little Rock Environmental Education Project is a Title III ESEA project designed to develop a sequential series of curriculum units in environmental education for grades 4 through 12. Emphasis will be placed upon a different area of environmental education in each curriculum unit as shown below.

GRADE	ENVIRONMENTAL UNIT
4	Nature of the Environment
5	Interdependence in the Environment
6	Types of Environments
8	Types of Pollution
9	Environmental Decisions
10	The Balance of Nature
11	Environmental Problems
12	Population Problems
12	Science and Survival

Each curriculum unit, which will require three weeks of class time, will be multidisciplinary in nature and will be structured around student-centered activities. One off-campus field trip will be included in each unit for grades 4, 5, 6, and 10. Each curriculum unit will include the following components: (a) an overview of the unit, (b) the major concepts in the unit, (c) the behavioral objectives for the unit, (d) a daily schedule for the unit, (e) lesson plans for classroom activities and field trip (if applicable), (f) pre-test for unit, and (g) student and teacher evaluation of the unit.

The evaluation activities included in each unit are a very important part of the overall project design. The project objectives for the student activities are:

(1) The students will increase their knowledge about the environment and its problems. As a minimum gain, it is expected that the mean post test score will be 25 percent greater than the mean pre-test score.

(2) The students will respond positively to the Environmental Education Program. On the evaluation questionnaires that are given to the students after they have studied each unit, 70 percent of the responses will be in the favorable category.

TEACHER'S GUIDE

ENVIRONMENTAL EDUCATION UNIT

SOCIOLOGY

POPULATION PROBLEMS

LITTLE ROCK SCHOOL DISTRICT
ENVIRONMENTAL EDUCATION PROJECT
ESEA -TITLE III 1974-75

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Overview of Unit

The population unit is designed to make the student aware of the growth of human population and of the implications of increasing population for the well-being of men and nations.

The primary functions of this unit are to introduce the student to reasons for population growth, results of overextended populations, and solutions to overpopulation. Consideration must also be given to political and sociological problems which arise as adjuncts to the questions of population.

To these ends, the student will consider and evaluate extant solutions and investigate possible additional solutions to the present and future effects of this international dilemma.

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Major Concepts in Unit

1. Population changes include population decline, growth, distribution and size.

2. The age structure of a population is an indicator of future growth.

3. Personal actions can change the size and character of the population.

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Overall Behavioral Objectives for Unit

Cognitive:

1. The student will analyze the continuous population growth as measured by interpretations of charts and graphs.

2. The student will identify some of the implications of changes in population growth on the structures of developed and developing nations as measured by class discussion, interpretation of charts, maps, statistical data and teacher made tests.

3. The student will research existing solutions to population growth and changes and validate possible solutions for future projections.

Affective:

The student will value his role as a factor in determining population changes.

Schedule for Unit

Day	Activity
1	Give Pre-test. Begin Activity 2: First reel of Population and the American Future
2	Continue Activity 2: Second reel of Population and the American Future Begin Activity 3: Each of Us: A Population Actor
3	Continue Activity 3 Begin Activity 4: Spaceship Earth
4	Continue Activity 4 Assign Census Data Group Work
5	Complete Activity 4 and have student group present Census Data Worksheet
6	Activity 5: Where Do the Children Play?
7	Activity 6: The Economy versus Ecology
8	Activity 7: Dimensions of the World Food Crisis Begin Activity 8: Survey: Marriage and Child Bearing
9	Continue Activity 8
10	Activity 9: All Our Future
11	Activity 10: Increased Food Supplies--Green Revolution
12	Activity 11: Increased Food Supplies--Food From The Sea Theory
13	Activity 12: Population Stabilization: How Close?
14	Activity 13: Review
15	Activity 14: Post Test Evaluation

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TEACHER'S GUIDE

ACTIVITY 1: Pre-Test

Time Required: ½ period (first half of day 1)

Purpose: To test the student's present knowledge concerning the material to be covered in the unit.

Materials Needed:

1. Pre-Test.
2. Pre-Test answer sheet.
3. Pre-Test/post test tally sheet.
4. Population and the American Future Booklet.

Procedure:

1. Distribute answer sheet and instruct students to write on the answer sheets and not the test.
2. Distribute test.
3. Allow 15 minutes for test.
4. Collect test and answer sheets.
5. Record correct score on tally sheets.
6. Assign the booklet Population and the American Future.

ACTIVITY 2: Film: Population and the American Future.

Time Required: 1 period (last half of day 1 and first half of day 2)

Purpose: To view the film and to explore population trends and their possible effects on the future.

Behavioral Objectives:

1. The student will be able to identify and discuss how population changes in the United States affect the individual and society as measured by his participation in class discussion.

2. After viewing the film the student will be able to list three to six commission recommendations.

Materials Needed:

Film: Population and the American Future

Background Information:

This film is based on the official report of the Commission on Population Growth and the American Future, which was established by Congress and appointed by President Nixon in March 1970. The Commissioners spent two years extensively investigating the nature of U.S. population growth and distribution. They have offered their findings and recommendations in both a written and a film version with the hope of reaching the majority of American citizens.

Vocabulary:

Population changes: include population decline as well as growth, distribution, and size.

Procedure:

1. Give students the reasons for the film.
2. View reel one the last half of day 1.
3. View reel two the first half of day 2.
4. Discuss film.

ACTIVITY 3: Each of Us: A Population Actor.

Time Required: 1 period

Purpose: To help students understand how their own actions can change the size and character of the population of which they are members.

Behavioral Objectives;

The student will be able to identify and discuss the significant population events in a person's life (e.g. birth, marriage, moving from place to place, bearing children, death).

Materials Needed:

Each of Us: A Population Actor (class sets)

Autobiography Part I (for each student)

Autobiography Part II (for each student)

Background Information:

The values we have and the decisions made by each of us, combined with those of millions of others, produce population trends. Each of us is, therefore, a population actor in an enormous cast.

One way to help students discover that they, too, are population actors is through the development of their own autobiographies.

Certain pertinent questions have been excluded from the autobiographical form because they relate to personal and private matters. For example, questions about sexual experience, abortions, etc. are not included.

Procedure.

1. Read "Each of Us: A Population Actor"
2. Distribute Autobiography Part I and have each student respond in order to see what he or she already knows about his or her role as a population actor.
3. Distribute Autobiography Part II. These questions are designed to reveal the specific decisions and actions of each population actor.
4. Use Optional Tabulation of Personal Characteristics to discover group characteristics, differences between groups, trends, etc.

II EACH OF US: A POPULATION ACTOR

Whether we are conscious of it or not, whether we intend it or not, each of us is a population actor. Each of us participates in population processes. Sometimes we have control over these processes; other times not. Sometimes we are aware of our influence; too often we are not.

For instance, none of us has control over our own birth or death, yet each of us contributes to the country's birth rate and death rate. When we as individuals can choose whether to marry and when, the number of children to have, where to live, how to get to work, or where to spend vacations, we have control over population-related actions. All of these actions involve us in population processes.

But few of us are completely free to live *as* we choose or *where* we choose. A decision to move from the city to the suburbs, for instance, is affected by such practical realities as the opportunities for jobs, transportation, housing, and credit. Racial and sex discrimination also inhibit our freedom to move at will. Nor is it reasonable to expect that a man and woman can plan each birth if they don't have access to both fertility control information and services.

We are all participating in population change, but no one of us can create or solve the resulting problems alone. Population problems *affect* us individually but *result* from an aggregate of decisions.

Consider the patterns of population distribution that have led to the growth of our large metropolitan centers. The movement of people into suburban communities surrounding U.S. cities has sharply changed the patterns of residence in this country. At the turn of the century, half of all Americans lived on farms or in small villages. Today seven of every ten persons live in metropolitan areas, that is, in cities of 50,000 or more and the surrounding counties that are economically integrated with them. Between 1960 and 1970 the metropolitan population of the United States grew 23 percent, largely through the growth of suburbia. Future metropolitan growth will occur with the continued expansion of these suburban areas.

An aerial view of a metropolitan area may give the misleading impression that the suburbs were developed in accordance with some grand blueprint. But this redistribution of population involved thousands of separate decisions made by individuals and groups who acted as home-buyers, builders, realtors, and lenders. This transformation is one of the most impressive results of population changes in the nation's history. Combined with poor planning, it has resulted in some of our worst problems—congestion, pollution, and shortage of recreation space.

Who builds suburbia? Population actors—people who move to the suburbs or who somehow influence others to move. It's not often that the people who are moving consider the demographic consequences of their decisions. Nor is it realistic to expect such decisions to be geared to the likely population outcome. Many of us have no choice in this matter. We move because of housing costs, location of available jobs, and other factors. But at least by acknowledging the impact that we make collectively, we realize our stake in the process of community planning. If community consequences are ignored, the quality of common or public resources easily can deteriorate.

The problems resulting from population movement do not simply involve more or fewer people. The speed with which a community gains

or loses people, or the rate of change, is often at the core of adjustment problems. Migration, both in and out of a community, signals a process of adjustment between the changing population and the social and economic activities of the community. The settlement patterns of today's 5 million young adults, who are marrying and becoming parents, will determine where future population growth occurs and where added demands for housing, health, and education services will be felt.

Clearly, we participate and have an important stake in a variety of population processes. The following discussion of life cycles may help us see our own roles as population actors more easily.

Birth: We've All Been Through It

The birth of a new baby usually fills parents with a mixture of feelings. Tenderness and love may predominate, but there are also realistic concerns about the responsibility, the expense, the pile of diapers, and the midnight feedings. It is hardly surprising that parents don't also think of their newborn son or daughter as a "population event."

To its parents, the newborn is Larry or Carrie, Jerry or Beth. To society the newborn will be an addition to school enrollment, the labor force, the armed forces, and a consumer of social and health services.

In the hospital nursery all babies appear to be much alike with the same prospects before them. But they are not alike. All are born as the result of the actions of an earlier generation of population actors; their advent into this world may have been an intended or — unfortunately — an unintended consequence of their parents' sexual activity. For a variety of reasons—including youthful marriage or accidental pregnancy—many parents will have children before they want them and many will have more children than planned. According to a recent national study 44 percent of all births between 1966 and 1970 were unplanned, and 15 percent were reported as having been unwanted.[1]

It would be a mistake, however, to assume that all unwanted pregnancies necessarily result in unwanted children. Many, perhaps most, of the children are eventually accepted and loved.

All the children born during the same year have one thing in common. They are members of the same birth cohort. Recession, wars, and certain other economic, political, and social events will occur at the same points in the lives of each member of that cohort.

Babies born in 1920 experienced the Great Depression that began in 1929. World War II was another event shared by this cohort. Many died in that war; for others, marriage and childbirth had to be postponed until after the war. This cohort's contribution to the postwar "baby boom" can only be understood if we take these earlier events into consideration. Similarly, the cohorts of persons born during the 1970s will be affected by coming shifts in the economy, by swiftly changing sexual and social mores, by the extent to which racial discrimination continues to inhibit equal opportunity, by new attitudes toward women, and by our awakening concern for the environment—all these will shape the values of the generation now growing up.

Growing Up—Picking Up Roles

A child does not make many population decisions directly, but he learns the values that will condition decisions made later in life. The young child observes the daily activities of family life and begins to understand the responsibilities involved in creating a home. It is here that the child initially learns his role as a population actor. Later, these roles are reinforced or challenged by other influences—school, church, peers.

A number of population events can and do occur during this period of the child's life. The birth of brothers or sisters creates changes that will affect the family and each member in it. Additions to the family will affect its financial and emotional resources and thus will influence the development of each child. Similarly, because of changes in the father's or mother's employment, or for some other reason, the family may move from one place

[1] 1970 National Fertility Study conducted by the Office of Population Research, Princeton University.

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to another. The migration of this family may have important consequences for the child as well as for others. The community may or may not be prepared to provide his parents with satisfactory housing and adequate social services or to welcome the child into a new school or playground.

Coming of Age—Decisions, Decisions

A crucial period stretches between the ages of 15 and 25. During this time the population actor is faced with a series of decisions: whether to go on to college after completing high school, the selection of a vocation or profession, where to live and work, if and when to marry and if and when to have children. Some of these decisions will be made consciously, others unconsciously, and still others will be made automatically in accord with the values and expectations learned in childhood.

Most young population actors take marriage for granted. A majority not only marry, but they marry at about the same period of their lives. In 1970 the median age at first marriage was 23.2 for men and 20.8 for women. An overwhelming majority of these couples expect to have children and most want two or three. Such conformity is not coincidence; it indicates that most of us are following accepted behavior patterns. But not all population actors follow these common patterns of childbearing. For some, larger families are desired. For others, babies arrive too often or too early. Just as the population actor may have been "unwanted" or "unplanned," his children may arrive in the same fashion.

Girls who become pregnant as adolescents face particular problems. In 1968 more than one of every six children was born to a mother under 20 years of age. More than 25 percent of these children were born out of wedlock.[1] A national study of unmarried teen-aged girls indicated that 14 percent of the 15-year-olds and 46 percent of those who were 19 reported having had sexual relations. Yet only 20 percent of these girls used contraception regularly.[2]

Clearly, teen-agers and young adults face an almost bewildering array of events, each of which will influence later behavior. Decisions faced at this age are not limited to reproductive activity. Late adolescence and early adulthood are also periods in which the first decisions are made about migration. Nearly 40 million Americans, or one in five, move each year. About one-third of these migrants are in their twenties and move to take new jobs or to finish their education.

The Middle Years

These are the years in which the role of citizen is the crucial one for population actors. Through the electoral process and group action, every individual has an opportunity to help make decisions about numerous policies affecting his community, state, and nation. Population processes are often affected by these public decisions regarding land zoning, recreation and housing, education, day care programs, health services, and so on. All these decisions may have substantial influence on population change, both locally and nationally.

These middle years also are a time when most of us are highly productive in the economic sector as well as in the home. The burden of supporting the dependent members of the population—the sick and disabled, the very young and the very old—is heaviest during these years.

Retirement: Looking Back

In retirement the population actor is able to look back at a society that he helped to shape. The course of population growth as well as the issues confronted in suburbia, rural areas, and urban centers were influenced by his decisions. But perhaps most importantly, his decisions about reproduction have helped to set forces into motion that will continue for a long time. As the population actor completes his lifetime, his grandchildren will begin to have children of their own. This fourth generation and those who survive from the three that precede it will form the population of the United States in the middle of the twenty-first century.

[1] Commission on Population Growth and the American Future, *Population and the American Future* (1972), p. 88. Cited hereinafter as Commission Report.

[2] Ibid., p. 85.

Autobiography Part I

Persons are born and they die—these two events enclose a lifetime. During this lifetime, all kinds of population events occur. Using your own life, develop an autobiography outlining population events in your life, past, present, and future. For example, the times you moved as a child, plans you've formulated for your own family, and your occupational prospects might be included. You may wish to think of your lifetime as having three parts: (1) the period between your birth and the present; (2) the period between the present and the near future—the years immediately after you leave school; and (3) the distant future—perhaps beyond age 30, to old age.

My Autobiography Outline

I Am A Population Actor!

Past	Present	Future
(time between birth and present)	(time between the present and the near future)	(the distant future)

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Autobiography Part II

Below is a form for listing important facts that shape the lives of population actors. Some are factors that may only slightly influence your population behavior, while others are the very basis for the decisions that you make. When this list is completed you will be able to chart the determinants and consequences of your own population behavior.

A. PERSONAL CHARACTERISTICS

Age _____ Year of Birth _____ Sex _____ Race _____

Birthplace _____ Approx. Size of Birthplace _____
city state

Present Residence _____ Approx. Size of present
town or city

Residence _____

Life Expectancy _____ Future Occupation _____

Intention to Marry _____ Expected Number of Children _____

In what ways are these facts important to you as a population actor? For example, does your sex or race influence your life expectancy? How else might these facts influence your chances in life? Do you live in the same town in which you were born? Why or why not?

B. YOUR ANCESTORS

1. Grandparents	birthplace (state or county)	present residence	life span (length of life)
mother's mother			
mother's father			
father's mother			
father's father			

Does the migration history of your grandparents have any implications for you? For example, if they were born abroad, do you retain any of their ethnic characteristics--language, food, social customs? After coming to the United States did they settle in a rural area or in a city? _____
Are any of them still alive?
Do they live with your parents, nearby, or far away?
How does this affect the life of you and your family?
Fifty years ago, what do you think the family structure might have been?
If any of your grandparents are no longer living, how many years did they live?
Is it likely that you will live longer than they?

2. Parents	birthplace	age
mother		
father		

you are no. _____ of _____ children.
(1,2, etc)

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Migration after marriage

Name of place	rural	urban center	suburb
(1)			
(2)			
(3)			
(4)			
(5)			

During what time in American history did your parents marry, e.g. World War II? Postwar?
How might this influence their decisions on the size of their family?
How did the events which occurred during their lifetime (wars, job changes) influence their migration history?

C. YOUR MIGRATION HISTORY

Name of place	rural	urban center	suburb
(1)			
(2)			
(3)			
(4)			
(5)			

What effects, if any, did these moves have upon your life?

Do you remember changes in school, changes in friends, and changes in playground and recreational opportunities?

D. YOUR FUTURE

What kind of decisions are you making as a population actor?

What moves and occupational changes do you anticipate?

Where would you like to live when you get older? Do you prefer any particular region? Why?

Would you prefer to live in the suburbs, the city, or the country? Why?

If you have children and your youngest child is born when you are ____, by your best estimate, you will be ____ when the child leaves home for college or his or her own home. This means you would have _____ years at home without children until retirement. What implication does this have for your role as husband or wife?

Similarly, at retirement, how many years of life will you have left? (retirement age compared to life expectancy at age 65). How will you plan for these years? How might your life change without employment?

Optional Tabulation of Personal Characteristics

Average age _____

(Sum of all individual ages divided by number of persons in the group.)

Range of birthplace by size of population:	No.	Percent
Under 2,500	_____	_____
2,500-10,000	_____	_____
10,000-50,000	_____	_____
50,000-100,000	_____	_____
100,000-500,000	_____	_____
Over 500,000	_____	_____

(To obtain percent distribution, divide the number of persons from a particular size birthplace by the total number of persons in the entire group.)

Birthplace by state:

How many different states are represented? _____

How many different regions or geographic divisions? (See Bureau of the Census map) _____

How many different countries? _____

Present residence:	No.	Percent
Living in same house as at birth	_____	_____
In same town	_____	_____
In same state	_____	_____
In same country	_____	_____

Sex ratio _____

(The sex ratio is the ratio of males to 100 females in a population and is obtained by taking the number of males divided by the number of females and multiply by 100.)

If sex ratio > 100, there is an excess of males.

If sex ratio = 100, the number of males and females is equal.

If sex ratio < 100, there is an excess of females.

Compare the group's sex ratio with those for the United States as a whole from 1900 to 1970 as shown in the figure at left.

Intention to marry:	No.	Percent
Males intending to marry	_____	_____
Females intending to marry	_____	_____

Compare the group's results with the following national figures:
95.0 percent of U.S. women aged 50 in 1970 were ever married. [1]
92.4 percent of U.S. men aged 50 in 1970 were ever married.

Average number of births expected:

By all persons in the group _____

By all females in the group _____

By all males in the group _____

(To obtain average, divide the number of births expected by each subgroup by the total number in that subgroup.) Compare the group's results with the following data collected from a national survey on births expected by wives 18 to 24 years of age.[2]

In 1967, average number of births expected	2.9
In 1971, average number of births expected	2.4
In 1972, average number of births expected	2.3

[1] U.S. Bureau of the Census, *Statistical Abstract of the United States: 1971* (1971). "Ever married" is a demographic term referring to those persons who are presently married, widowed or divorced.

[2] U.S. Bureau of the Census, "Birth Expectations and Fertility: June, 1972," *Current Population Reports* (September 1972).

TEACHER'S GUIDE

ACTIVITY 4: Spaceship Earth

Time Required: ½ period to 'set up'; 10 minutes at a time for 2 or 3 students to carry out the activity sometime during week 1.

Purpose: To illustrate the impact of various birth and death rates on population size and to indicate that a balance must ultimately be obtained.

Behavioral Objectives:

The students will be able to analyze the effect of some relationships between birth and death rates as measured by their participation in the three models.

Materials Needed:

1. 2 beakers (150 ml and 250 ml)
2. Ring stand
3. metal ring
4. 250 ml separatory funnels
5. Medicine droppers
6. Spaceship Earth Worksheet (for each student)
7. Census Data Worksheet (5 per class)

Background Information:

Dr. Paul Ehrlich has likened the historical development of the human population explosion to a large bowl with a faucet on the top and a drain on the bottom. In the early stages of human population, the faucet, representing the birth rate, was on full force but the drain, representing the death rate, was also wide open. As man started to modify the environment, the first bits of grit began to plug the drain and the bowl started to fill. Like the bowl, however, the carrying capacity of the earth is not infinite. Man must control his own numbers or face the consequences of overpopulation as already exemplified by other animal populations when they have reached the maximum size tolerated by prevailing environmental conditions.

In this activity, three models can be shown: high birth rates/high death rates (the human population until eighteenth century); high birth rates/low death rates (developing countries of today); low birth rates/low death rates (developed countries of today, with some countries of ZPG).

An appropriate analogy is to compare the earth and its people to a space capsule and the number of astronauts it can support over a period of time. Each system is selfcontained and finite.

This model does not take migration into account, nor does it illustrate distribution or density.

Vocabulary:

ZPG - Zero Population Growth: the stabilization of a country's growth rate at 0.0%. This occurs when birth rates and death rates are equal, assuming no net effect of migration. A stationary population in which population does not significantly increase or decrease in size.

Procedure:

1. Have a couple of students assemble the model according to example shown on student worksheet.

2. Explain to students the purpose of this activity.

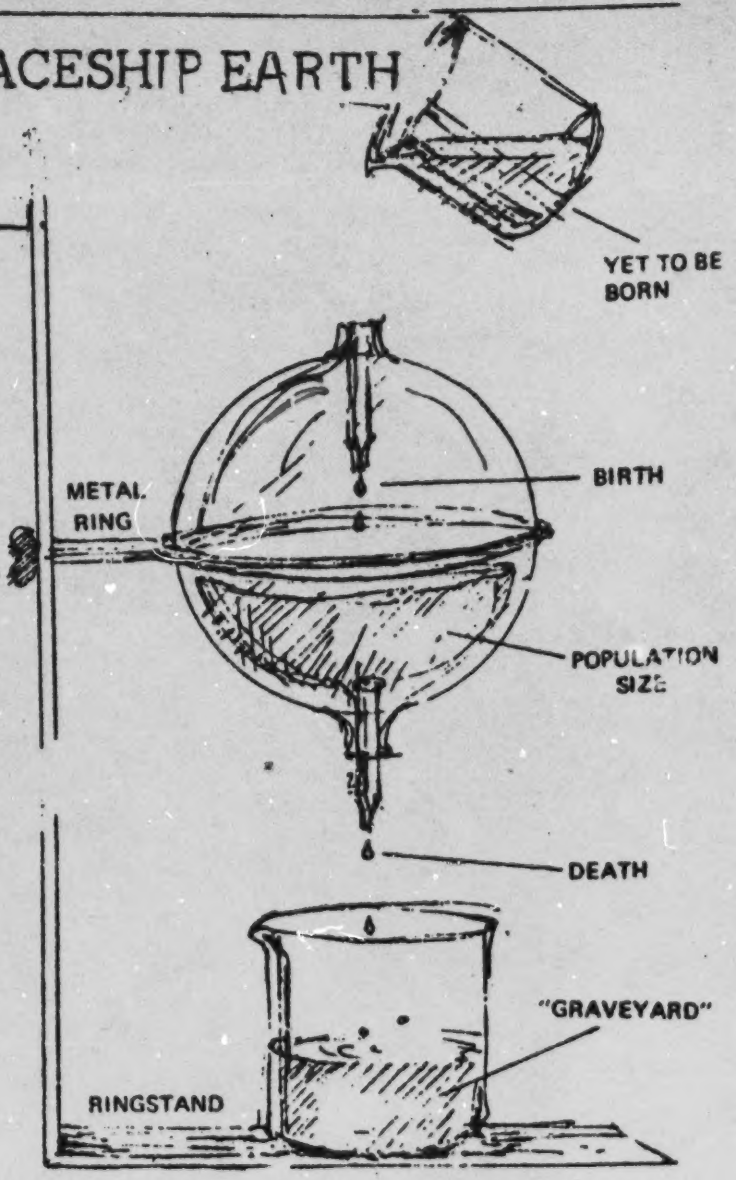
3. Instruct students to complete worksheet during week one and return to you.

4. Have a committee of students do the research for the Census Data Worksheet and present to the class at the end of the week.

SPACESHIP EARTH

NAME _____

DATE _____



1. If you open the top stopcock, what happens to the population level?

_____

_____

What causes population levels to increase?

_____

2. If you open the bottom stopcock, what happens to the population level?

_____

_____

What causes population levels to decrease?

_____

Look at some relationships between birth and death rates, and make the model illustrate them to you.

if birth rate is:	and death rate is:	population size: (Increase, decreases, remains the same)
high	high	
low	low	
low	high	
high	low	

Does the glass ball ever become filled to capacity? _____ When? _____

Can anything be done to make more room? _____

In what way does the concept "spaceship earth" represent substantial changes in our thinking?

_____

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Organizations other than government make use of census data. Businesses use population data to project where the future markets will be. A bank can study statistics for nearby towns before deciding where to open a branch. Supermarkets and department stores can predict new market areas. Most manufacturing concerns planning new plants study census figures about population, employment, and job skills. There are far too many individual uses to list. The data from the census is available to any individual or organization willing to analyze the statistics to make the projections they need.

Finally, it is important to remember that the decennial census (that taken every ten years) is a measurement of the population at one particular time, it is rather like a photograph capturing just one frozen moment of a continous action. For the United States Census, the one particular time was April 1, 1970. It is the task of the demographer to try to piece together, using vital statistics, some explanation of the events that took place before the census and those that can be expected to take place after the census.

Exercises on the Census

Obtain the census data for Little Rock for the last 5 decennial census at the town hall. Prepare charts and graphs of the changes your city, town or state has undergone in the last fifty years. Some suggestions for graphs and charts are listed below:

Total Population vs Time (years)
Population 18 and under vs Time (years)
Birth Rate vs Time (years)
Death Rate vs Time (years)
Family Size vs Time (years)
Percent of Families within various income groups

Two more possibilities for the use of census data.

1. Invite the district manager or regional field director of the census in your area to visit your school and discuss the census process and the results of the 1970 census.

2. Investigate the other census performed by the Bureau of the Census in addition to population such as housing, agriculture, business, and manufacturers.

TEACHER'S GUIDE

ACTIVITY 5: Where Do The Children Play?

Time Required: 1 period

Purpose: To have students discuss the complexity of the concept of progress as it pertains to population and economic growth.

Behavioral Objectives:

The students will analyze the song and discuss the difference between "progress" that increases the quality of our children's lives and progress that may threaten it as measured by class participation.

Materials Needed:

Where Do The Children Play? worksheet

Background Information:

In considering the relationship between the economy and population growth, the Commission made the following statement:

> We have looked for, and have not found, any convincing economic argument for continued national population growth. The health of our economy does not depend on it. The vitality of business does not depend on it. The welfare of the average person certainly does not depend on it.[1]

The popular song writer, Cat Stevens, and members of the Commission on Population growth and the American Future share a common concern: availability of recreation space.

More and more American families have the time, the money, and the inclination to enjoy the outdoors. With better roads and easier travel, national parks have in effect become city parks for the residents of nearby urban areas. The Commission's research revealed that in the past 10 years, visitors to all national parks more than doubled, while the area of the parks increased by only 20 percent. There are still many areas to enjoy and more to be developed, but the enjoyment will depend largely on how fast the population grows.

The song is one written by Cat Stevens in 1970.

Procedure:

1. Distribute Where Do The Children Play? worksheet.
2. Allow time for reading and answering questions.
3. Have students discuss and compare answers in small groups.

[1]Commission Report, p. 41

WHERE DO THE CHILDREN PLAY?

NAME _____

DATE _____

1) Well I think it's fine building Jumbo planes, or taking a ride on a cosmic train, switch on summer from a slot machine, yes get what you want to, if you want, 'cause you can get anything. I know we've come a long way, we're changing day to day, but tell me, where d' th' ch'ldr'n play.

2) Well you roll on roads over fresh green grass, for your lorry loads pumping petrol gas, and you make them long and you make them tough, but they just go on and on, and it seems that you can't get off. Oh, I know we've come a long way, we're changing day to day, but tell me where d' th' ch'ldr'n play.

3) Well you've cracked the sky, scrapers fill the air, but will you keep on building higher 'till there's no more room up there. Will you make us laugh, will you make us cry, will you tell us when to live, will you tell us when to die? I know we've come a long way, we're changing day to day. But tell me, where d' th' ch'ldr'n play.

Questions:

1. What is this song all about? _____

2. How does the author feel about the subject of this song? _____

   What words or phrases in the song make you think he feels this way? _____

   _____

3. Do you agree with Cat Stevens? _____
   Why? _____
   Do you think what he says applies to your community? _____

4. One line says: yes get what you want to, if you want, 'cause you can get anything. What does the author mean?

   _____

5. Why do you suppose the author keeps repeating the title of the song after each verse? _____
   Why does he stress the urgency of acting now? _____

6. Playgrounds are just one example of things of value for our children that we may be losing. What are others?

   _____

   Discuss possible solutions or policies that might help us maintain those things we value.

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TEACHER'S GUIDE

ACTIVITY 6: The Economy versus Ecology (16 minutes)

Time Required: 1 period

Purpose: To help students realize the problems that may result from aggregate demand as well as from rapid and unplanned growth.

Behavioral Objectives:

The student will be able to preceive the conflict between unchecked economic growth and a quality environment as measured by his discussion of the filmstrip.

Materials Needed:

filmstrip: The Economy versus Ecology
Economy versus Ecology worksheet

Procedure:

1. Show the first 23 frames and then have the students discuss the four questions relating to those frames.
2. Show frames 24 through 48 and encourage the students to answer the next four questions.
3. Show frames 49 through 60 and answer the next five questions.
4. Project frames 61 through 69 and answer the last four questions.
5. Assign as homework pp. 105-109 in Sociology Social Life.

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The Economy versus Ecology

NAME _____

DATE _____

Frames 1 - 23.

1. What is the estimated cost of controlling pollution and cleaning up the U.S. environment?
   (The U. S. government estimates it will cost a total of about $287 billion over the next ten years to control pollution. That's about $1,400 for every American.)
2. Why did Coloradans reject the 1976 Winter Olympic Games?
   (They were fearful of possible ecological damage.)

3. What effects will new car exhaust restrictions have on automobile cost and performance?
   (less efficient and more expensive motor vehicles)

4. Describe some of the environmental problems facing other nations.
   (Air pollution in Tokyo; Rome's ancient coliseum is being eroded by noxious fumes; trees in the Communist nations are killed by fumes from a Soviet refinery; Russia's Lake Baikal is being contaminated by pulp and paper mills and poisons in the Caspian Sea treaten the Soviet Unions caviar industry. Sulfur dioxide emitted by factories in West Germany falls as sulfuric acid in the rain and snow of Sweden.

Frames 24-48.

1. What have been the objectives of the Earth Days and Earth Weeks of recent years?
   (to call attention on the dispoiling of "America the Beautiful")

2. What does Paul Ehrlich consider the major cause of the ecological crisis? What steps does he urge?
   (uncontrolled population)

3. What does Barry Commoner consider the major cause of the ecological crisis? What steps does he urge?
   (Technology)

4. Do you agree with Ehrlich or Commoner? Or both? Give reasons for your answer.
5. How do we measure the state of the U.S. Economy?
   (In terms of gross national product-GNP, the total dollar value of all goods and services produced during a year.)
6. Can economic growth continue indefinitely? Why or why not?
   (no)

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Frames 49 - 60.

1. Describe some environmental victories of recent years. Have any occurred in your state? (EPA shut down 23 major industrial plants; Oregon's bottle bill; Delaware's ban on oil refineries and steel and paper mills for a 125 mile stretch of still undeveloped coastline.)
2. Who has supported U.S. development of an SST? Why do you feel the plane should be built? (The government, the aerospace industry and organized labor.)

3. Who has opposed development of the SST? Why?
(Environmentalist because they say the plane would never pay for itself, its sonic booms would damage health and property and it might deplete the life-protecting layer of ozone in the stratosphere.)

4. Do you think an SST should be developed in the U.S.? Do you think the government (the taxpayers) should finance the project?

5. Recently, several major U. S. airlines dropped their options to buy the British-French Concorde. Why?

Frames 60 - 69.

1. Why do we need national policy on energy? (To determine how much power will be needed, where the new power plants are to be located, what's the best way to generate electric power without pollution and without hazard.)

2. Why do we need a policy on land use? Should this be a national policy or should each state formulate its own policy? Explain your answer.
(to insure that our wilderness areas, wetlands, parks and unspoiled coastline can be bequeathed to future generations.)

3. Which nation is the world's biggest polluter? Why?
(U.S.)

4. What are the attitudes of developing nations toward pollution? Why?
(that for them the problem of proverty is more important than pollution.)

TEACHER'S GUIDE

ACTIVITY 7: Dimensions of the World Food Crisis by H. F. Robinson

Time Required: ¼ period

Purpose: To encourage the student to analyze articles and compare information.

Behavioral Objectives:

The student will be able to listen to what seems to be contradictory statements and analyze the data as measured by class participation.

Materials Needed:

The World in Minature (class set)
Robert F. Kennedy's comments (class set)

Procedure:

1. Distribute copies of World Town in Minature.
2. Read aloud for most impact.
3. Read Robert F. Kennedy's comments.
4. Compare these seemingly contradictions and ask these questions.
   a) How can we be so rich and still have such poverty?
   b) Would the people who are hungry in America be as hungry as those in Asia?
   c) Do we have "hungry" people in Pulaski County? If so, why don't we hear more about them?

"The World in Minature" by Henry Smith Leiper was removed to conform with copyright laws.

---Henry Smith Leiper*

*Dr. Leiper has been a minister of the Congregational Church and worked with the World Council of Churches. At the present time, he is a member of the Board of the Congregational Ministries.

Excerpt from Hunger, USA by the Citizens Board of Inquiry (Beacon Press: 1969) was removed to conform with copyright laws.

TEACHER'S GUIDE

ACTIVITY 8: Survey: Marriage and Childbearing

Time Required: 1 period

Purpose: To help the student recognize his attitudes toward marriage and childbearing.

Behavioral Objective:

The student will analyze the class results of the survey and compare his own response as to whether he is conditioned by cultural and social forms.

Materials Needed:

Survey: Marriage and Childbearing

Background Information:

Until modern times, high rates of reproduction were necessary to offset high mortality--especially infant mortality. In agricultural societies children were assets in the home and farm-centered economy. Also, before care of the aged became institutionalized, parents had to rely upon their children for care in their old age. Large numbers of children were advantageous. As a result of these factors and of short life expectancy, American women spent most of their lives bearing and rearing four or five children.

Long before the tradition of the large family disappeared, some couples had begun to adopt the small family pattern. As a result of declining mortality rates, a diminishing need for child labor in agriculture, increasing costs of raising children in an industrialized urban society, and improved methods of fertility control, both the number of children desired and born declined.

Despite this trend, pronatalist pressures (those favoring childbearing) still exist. These include (1) the shaping of the young into sex-typed roles, with the boys pointed toward jobs and the girls toward home and motherhood; (2) discrimination against the working women and especially against the working mother; and (3) restrictions on higher education for women. Such forces are so pervasive that they are typically perceived as natural forces and not simply as cultural prescriptions.

Procedure:

1. Distribute Survey: Marriage and Childbearing
2. Complete
3. Tabulate Results:
   Look for these patterns:

   a) Most persons will probably indicate plans for marriage and childbearing that are quite similar--does this reveal cultural and social factors?
   b) Note those who do not expect the female to work after marriage. Are there differences in male and female responses?
   c) Do the answers to the questions on number of children expected and number desired differ? (If the same, mention that the Commission found that 44% of all births from 1966 to 1970 were reported as unplanned and 15% as unwanted.)
   d) Are these biases against nonmarriage and childless marriages? Are women expected to fit into the role of wife-homemaker-mother?
   e) The tabulated results to question 15 will reveal if the students agree with the Commission's recommendation. If the students answer in the affirmative, it means they do <u>not</u> reflect the recommendation for less regimented reproductive behavior made by the Commission. This recommendation was based on evidence that a nongrowing population could be reached <u>if</u>, on the average, families had two children. This was not recommended as a standard for all to believe.
   f) After discussion and analysis of their own attitudes, share the following statement from the Commission for further comparisonn.

      "The objective for American society should be to make the childbearing decision as free as possible of unintended societal pressures. It should not be to "force" people to become parents in order to seem "normal" but to recognize that some people, and perhaps many, are not really suited to parenthood. We should strive for the ideal of diversity in which it would be equally honorable to marry or not, to be childless or not, to have one child or two, or, for that matter more. Our goal is one of less regimentation, not more."

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SURVEY: MARRIAGE AND CHILDBEARING

1. Female_____ Male_____
2. Do you plan to marry? Yes_____ No_____
3. If yes, at what age do you plan to marry? Age_____
4. If female and you plan to marry, do you plan to work after marriage? Yes_____ No_____
5. If male and you plan to marry, would you like your wife to work after marriage? Yes_____ No_____
6. If female how long will you work? If male, how long should your wife work after marriage? Years_____
7. If you plan to have children, at what age would you expect to have your first child? Age_____
8. How many children do you want to have? No._____
9. How many children do you *expect* to have? No._____
10. At what age would you expect to complete your childbearing? Age_____

Do you agree or disagree with the following statements:	Agree	Disagree
11. Part of the fulfillment of everyone's life is in marriage.	_____	_____
12. Part of the fulfillment of everyone's life is in having children.	_____	_____
13. A childless or a single-child family may have as fulfilling experiences as other families.	_____	_____
14. If a couple has the number of children they want, but all are of one sex, they should keep trying for a baby of the other sex.	_____	_____
15. All American couples should have two children in the interests of stopping population growth.	_____	_____
16. Woman's place is in the home.	_____	_____
17. After marriage and childrearing, women should continue working.	_____	_____
18. Because most women marry and leave work when children are born, minor forms of job and pay discrimination must be expected.	_____	_____
19. Unmarried women who are in their 40's and 50's are lonelier than unmarried men of the same age.	_____	_____

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TEACHER'S GUIDE

ACTIVITY 9: All Our Future

Time Required: 1 period

Purpose: To review for the student the concepts of each individual as a population actor and the interrelatedness of economics, quality environment and population demands.

Behavioral Objective:

The student will be able to view life in many cultures but with basic needs and be able to discuss in small groups how great numbers of children in a given area help to determine the economics of the area, the health conditions of most residents, and the projections for the future.

Materials Needed:

film: All Our Future (35 minutes)
projector

Procedure:

1. View the film.
2. Discuss quality of life as one of these youngsters would see it.
3. Remind the students that this film will be useful information as they study the Green Revolution and the Food from the Sea Theory the next couple of days.

TEACHER'S GUIDE

ACTIVITY 10: Increased Food Supplies

Time Required: 1 period

Purpose: To have students review the potential of the Green Revolution and the Oceans for providing the food necessary in the next 50 years.

Behavioral Objective:

The student will understand the implications and effects of the Green Revolution as a major source of food to feed an increasing population as measured by his participation in class discussion.

Materials Needed:

Green Revolution Student Study Sheet (class set)

filmstrip: The Green Revolution- N.Y. Times

filmstrip projector

record player

Background Information:

Of the 3.5 billion people in the world today some one or two billion are estimated to be malnourished or undernourished. Paul Ehrlich in Famine, 1975: Fact or Fallacy estimates that 50% of the world's population is undernourished; 65% of it is malnourished. An excessively low protein diet in infancy has a determental effect on several crucial characterisitics: IQ, brain volume, and physical size, Nature provides that brain growth occurs after birth. This allows the fetus to be small enough to pass from the uterus. After birth, the size of the head and brain increases--a process that requires early protein synthesis. A low protein diet in these early stages reduces early brain development and could lead to mental retardation. In India, malnutrition leads to dwarfism, which is caused to a great extent by protein deficiency.

Procedure:

1. Distribute to the class the Green Revolution Student Study Sheets.
2. Allow time for reading.
3. Show filmstrip: "The Green Revolution".
4. Discuss the problems a nation or state considers in attempting to feed their population.
   a. Production
      1) Do we have the land for growing our foods?
      2) Are we capable of planting, cultivating, and harvesting the optimum yield per acre?
      3) Can enough food be raised without destroying land, water, and/or air by the over use of chemicals.

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b. Distribution
   1) How will we transport the food from the fields to the people?
   2) Will the transportation cost plus the production cost increase the price of food until it is prohibitive?
   3) Are we sending the desired food to all locals.

c. Quality
   1) Is the food nutritionally satisfying?
      Does each person receive enough calories for his daily diet?
      Does each person receive the minimum essential protein content from his food?
   2) Is the product fresh and palatable to the consumer.

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Student Study Sheet

Green Revolution

The Green Revolution is a term applied to the collective changes in agriculture that have evolved in order to increase the production of food. Some dramatic results of this transformation have been visible to the public in recent years but began in the nineteenth century. An indication of this change is that in 1860 95% of the population of the United States were farmers, but in 1960 only 5% were farmers, providing the food for the entire nation and producing a substantial surplus as well. The story of this accomplishment is called the Green Revolution. Examination of it is easiest if broken into three sections:

1) factors involved
2) environmental implications
3) outlook for the future

An outline of six components of the Green Revolution is provided as background.

I. Interfering with hydrologic cycle.
II. Altering the Energy Cycle.
III. Expanding the area under cultivation
IV. Breeding and genetics
V. Fertilizing
VI. Using Pesticides

Each of the six above components is divided into three parts.

1. Itemizes contents and cites examples
2. Lists environmental implications
3. Discusses the outlook as it relates to possible increased food production.

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Remember the below "Paradoxes and Priorities" of the Green Revolution.

The graph has been removed to conform with copyright laws.

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issue of International
Wildlife Magazine

THE GREEN REVOLUTION

I Interference with the hydrological (water) cycle

A. 1. irrigation
2. dams
3. lakes
4. chemical rainmaking
5. desalinization

B. 1. Dams trap valuable nutrients and minerals, preventing natural deposit on fields. The Aswan Dam in Egypt has prevented the natural flooding of the Nile River which deposited nutrients thus fertilizing the land.

2. Increases sewage problems because the reduced flow of the river cannot dilute sewage as well.

3. Dams increase the nitrogen content of the water, altering the habitat for fish and plants which depend on oxygen and carbon dioxide in water.

4. Most United States rivers are already maximally dammed.

C. Desalinization--very expensive for poor countries.

II Altering the Energy Cycle

A. 1. Harnessing animals to work in the fields
2. Internal Combustion Engine--Technology, in the form of farm machines, reduced the number of people needed for operations such as planting, harvesting, and milling.

B. Side effects have been minimal.

C. The economics of poor countries will not sustain mechanization of agriculture. The farms are mostly small and lack the capital needed to invest in mechanization. The technology is available but not the resources to pay for it.

III Expanding the Area Under Cultivation

A. 1. Clearing forests or woodland
2. Use of arid land through irrigation

B. 1. Sometimes cutting a forest has devastating effects on the soil through erosion

a. silt in streams
b. wind and rain remove soil and nutrients

2. Cutting forests removes a major source of oxygen in the ecosystem.

3. Slash and Burn Agriculture--The technique of clearing forests by burning away the vegetation destroys the fertility of the soil. The soil is fertile for only two years, after which it is abandoned to burn a new area of forest. This is a major problem in Brazil's Amazon Valley. The technique destroys valuable timber, wildlife habitat, and a major oxygen regeneration system.

C. 1. The United States is blessed with a large part of the world's supply of good farm land. Most poor countries are tropical or semi-tropical. In these countries, soils are in general much inferior to those in temperate zones. Crops and livestock are more easily infected and are more susceptible to parasites and pests.

2. To solve the food problem the world must expand food production by 30%. It is easy in the United States, Australia, Canada, and Russia. But the location of this potential food is another problem. The hungry are for the most part not in these countries. To buy food from another country, poor countries must have money. The purchase of large quanities of food places a heavy strain on the poor countries' balance of payments. Therefore most poor countries are forced to grow their own food.

IV Breeding and Genetics

A. 1. Animal breeding

a. The first cows produced 600 lbs. milk/year. New breeds today produce 8,000 lbs. milk/year.

b. First hens produced 15 eggs/year. Today new breeds produce 200 eggs/year.

2. Plant genetics - has provided new and better strains of crops which have higher yields per acre, e.g. wheat, rice, maize.

B. New breeds of cows and hens require high protein fish meal and cereal for food. Most of the Peruvian fish catch is consumed in the United States in forms of poultry, meat, and eggs. This requirement of high protein food for animals consume fish from a country which could use the fish to feed its own population. Peru sells the fish because of the high prices American farmers are willing and able to pay.

C. 1. The hybrid grains (wheat, rice and maize) depend very much on chemical fertilizers and pesticides. Poor countries cannot afford to buy or even manufacture necessary quantities. India alone could use the entire American production of fertilizer.

2. Successful hybrid strains in one country, one climate, one soil are not necessarily transferable elsewhere. In some other areas, these apparently "successful" strains might be susceptible to pests, parasites, and fungi. A hybrid might not survive in differing climates. This often means that a different high-yield rice must be developed for each region. This has been done with "Mexican Wheat" and "miracle rice" (Phillipines) to obtain yields of 3 to 4 times above those of normal strains.

3. Thus poor countries must have their own agricultural experts to develop hybrids that will be most productive for them. It takes years and considerable money to train these experts.

V Fertilizers

A. The heavy use of fertilizers has allowed soil to be repeatedly planted to the same crop and has helped to produce better yields per acre.

B. 1. Continued use destroys humus in soil

2. Excess fertilizer is carried into streams in rain run-off. The large amounts of nitrates and phosphates in chemical fertilizer are carried to lakes by the streams. The excess nitrates and fertilizers in the lake allows a rapid rate of euthophication.

3. Run-off of fertilizer into the water supply is a problem.

4. Fertilizers encourage farmers to plant one crop in one area. Uniformity of crop acreage allows rapid spread of disease.

C. 1. Fertilizers are expensive for poor countries.

2. In Africa lack of education makes instruction in spraying, fertilizing, and irrigation difficult and slow. With new grains, it is essential that work be done properly. Economically poor farmers are, in general, conservative and have displayed great resistance to most innovation.

3. Doubling of world food production will probably require tripling of fertilizer usage.

VI Pesticides

A. 1. Pesticides have reduced the loss of substantial parts of crops to pests.

2. Pesticides have encouraged one crop plantings.

B. 1. Some pesticides interfere with the reproduction of certain species of wildlife.

2. Pesticides recently have been shown to reduce photosynthesis in marine phytoplankton. Phytoplankton is the essential first step in the ocean's food chain.

3. To increase food yield there is a temptation to use more pesticides. Since the need is greatest in poor countries, they will use DDT because it is cheap--ergo ecological disaster.

C. 1. Pesticides are expensive.

2. Pesticides effective in one region of the world are not necessarily so in another. Some pests become resistant to some pesticides in a few generations. This occurs more swiftly in tropical climates where the growing season is uninterrupted by a long winter and where the number of species is usually greater.

Whatever the side effects of the Green Revolution, the main impact is an obvious benefit to mankind: the deferment of a collision between near-static food supplies and a growing population. Dr. Norman Earnest Borlaug, winner of the Nobel Peace Prize for work contributing to the Green Revolution, said, "The Green Revolution offers the possibility of buying 20 to 30 years time in which to bring population into balance with food production. After that, the inexorable Malthusian forces will once again begin operating--unless man uses the time to achieve broad scale population control."

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ACTIVITY 11: Increased Food Supplies (cont'd)

Time Required: 1 period

Purpose: To have students review the potential of getting food from the sea in the next fifty years.

Behavioral Objective:

The student will know the implications and effects of the Food from the Sea Theory as a major source of food to feed an increasing population as measured by his participation in small group discussions.

Materials Needed:

Food From The Sea Theory (class set)

Background Information:

Of the 3.5 billion people in the world today some one or two billion are estimated to be malnourished or undernourished. Paul Ehrlich in Famine, 1975: Fact or Fallacy estimates that 50% of the world's population is undernourished; 65% of it is malnourished. An excessively low protein diet in infancy has a detrimental effect on several crucial characteristics: IQ, brain volume, and physical size. Nature provides that brain growth occurs after birth. This allows the fetus to be small enough to pass from the uterus. After birth, the size of the head and brain increases--a process that requires extensive protein synthesis. A low protein diet in these early stages reduces early brain development and could lead to mental retardation. In India, malnutrition leads to dwarfism, which is caused to a great extent by protein deficiency.

Procedure:

1. Distribute the Food From The Sea Theory study sheets.

2. Divide the class into groups of 3 to 5 students.

3. Have the students discuss the validity of the Food From The Sea Theory and compare it with yesterday's discussion of the Green Revolution.

Student Study Sheet

"Food From The Sea" Theory

The attitude that "science will find a way" is often expressed by people confronted with the problems of pollution, scarcity of food, and so on. They ususally mean that technology is surely capable of finding a solution to any such problems we may face. One problem, harvesting large quantities of food from the sea, is often referred to in this context. Many people have voiced the opinion that greater or more efficient use of the sea as a source of food will help solve our future food problems. Let's examine some of the tenets of the food-from-the-sea theory and compare them to the actual capabilities and limitations of our technology.

As you examine the below arguments and counter-arguments keep these questions in mind:

Do you think the food from the sea theory is valid? Why or why not? Explain.

ARGUMENT 1: Increase the area of harvesting fish beyond the few selected coastal areas now used (off Newfoundland, Africa, New Zealand, Peru and some others). By increasing the area over which we fish, it should be possible to increase the catch.

COUNTERARGUMENT:

1. Most of the world's fish spawn and feed in the coastal areas, including estuaries and coastal wetlands.

2. The open sea is 90% of the ocean and 3/4 of the Earth's surface. This is essentially a biological desert. It produces a negligible fraction of the world's fish catch and has little potential for the future.

Zone	% of ocean	annual fish production in metric tons	% of fish catch
open ocean	90	160,000	.06%
Coastal zone	9.0	120,000,000	49.96%
coastal wetlands and estuaries	0.1	120,000,000	49.96%

ARGUMENT II: With more efficient fishing we can greatly increase our yield of ocean fish. Harvesting of fish is not yet at the level which the sea produces.

COUNTERARGUMENT:

1. Modern fishing is presently done with mechanized trawlers and other catching ships, holding ships, factory ships, freezing plant ships, fish-tracking radar (sonar), and world-wide fleets that are serviced at sea and hence only seldom return to port. A high level of technology has already been applied.

00045

2. At most, only 40% of the available fish can be harvested in a given year in order to insure sufficient breeding stock for the next year's catch. The 1967 fish harvest was about 60 million metric tons. Biologists put the maximum sustainable catch at 100 to 150 million metric tons annually. A maximum three-fold increase seems possible. World population will triple in 50 years. Then what?

3. The competition for the fish catch has led to the building of bigger and better fishing vessels, which have sometimes passed the point of diminishing returns: several areas have reported steadily decreasing yields despite increased efforts, because more efficient fishing has resulted in the taking of those fish necessary to maintain the species. that is, the sustainable yield has been exceeded. This has happened off the coast of Peru. The sardine has become extinct in California waters because of such overfishing.

4. Look at the experience of the whaling industry in non-antartic waters, despite the use of more and better equipment each year.

Year	Catch in blue whale units
1963-64	8429
1964-65	7052
1965-66	4089
1966-67	3511

Another case of removing too many of a species to allow normal production of offspring.

ARGUMENT III. The hungry nations should be encouraged to fish more because they are the ones that need a high protein food.

COUNTERARGUMENT:

1. The chief fishing nations are Peru, Japan, and Russia, followed by China, the United States, Canada and Norway. Some fishing is also done by Germany and Britian. They are not the hungry nations.

2. In 1967, 45% of the world's fish catch was ground into fish meal and used to feed animals in the rich countries: more than 1/3 was sold as food in the rich countries: only 17% reached the hungry countries. 1/3 of Latin America's fish production goes to the United States, the rest goes to western Europe. This amounts to a total protein outflow equal to 150% of the total meat production of Latin America, or 200% of the total milk production. The best cuts of meat and fish are usually frozen and sold to the rich countries; the less desirable cuts are salted and sold in the poor countries. So most of the present harvest of the sea goes to the rich countries and does nothing toward alleviating hunger in the poor countries.

ARGUMENT IV. The oceans are so vast that pollution cannot reduce their capacity to produce.

COUNTERARGUMENT:

1. The coastal areas (the breeding area for fish and the most productive harvest grounds) are most vulnerable to man's pollution. Not only are coastal areas subjected to sewage dumped from shoreline cities and to material carried into estuaries by polluted rivers, but they are often filled for building, used as garbage dumps, and polluted by oil spills.

2. Garbage, radioactive wastes, surplus chemical weapons, sewage sludge, etc. are routinely dumped into the ocean.

3. The sea is contaminated with oil which is carcinogenic and with pesticides which can interfere with reproductive hormones. Oil spills in 1968, 1969, 1970 and 1971 in California, the Gulf Coast, the East Coast, Europe, etc., have killed untold fish and birds.

4. A large part of the sea-harvest is shell fish which are harvested from coastal regions. These areas are most susceptible to pollution. Report of the Fisheries Division of the Georgia Fish and Wildlife Commission indicates that Georgia coastal shell fish production has gone from 8,000,000 pnds. in 1908 to 300,000 pounds in 1950 to about 160,000 pounds in 1961.

5. A large number of shell fish beds off Connecticut and New York were closed to harvesting by health officials because of the high coliform bacteria levels in coastal waters.

6. In 1970, Mercury contamination was detected in tuna and swordfish. The FDA recommends that swordfish not be consumed because of high levels of mercury which would be dangerous to man.

The real chances for this food from the sea to provide food for the world's hungry are summarized in Moment in The Sun by Robert and Leona Train Rienow

> But the fishing grounds are flagging. Salmon catches are critically lower. Sardines are becoming elusive. Halibut is under hemisperic conservation plan. Fish wars are being fought between Korea and Japan, Iceland and Great Britian. The sea is, of course, boundless. There are relatively untapped grounds off the east coast of Africa and in the Indian Ocean. Nonetheless, most areas now show strain. If we approach them with the air of prodigality that has marked our treatment of the land and the pressure of billions of hungry clamoring people, the seas will not sustain us even in protein "retch-meal".

Protein "retching-meal" refers to the plans advanced by some to move down the food chain and make protein meal out of fish, plankton, and sea-weed.

00047

TEACHER'S GUIDE

ACTIVITY 12: Population Stabilization: How Close?

Time Required: 1 period

Purpose: To encourage the student to evaluate his role in stabilizing the population.

Behavioral Objective:

The student will evaluate a list of trends that can contribute to or destroy the possibilities of stabilizing the American population as measured by his class work and class discussion.

Materials Needed:

Population Stabilization: How Close? (class set)

Background Information:

We know that the earth is finite, limited in many ways: in terms of physical size and in the biological and human population it can support in comfort and health.

FIVE ALTERNATIVE IMAGES FOR THE FUTURE

1. Mankind will expand until it has exhausted the earth and will then perish.
2. Nature will "backlash": natural catastrophe will keep the human population in check, as it has done in the past, through famine, plague, etc.
3. Conflict of various groups over limited resources will lead to general war and the breakdown of society.
4. Human population will grow until discomfort is unendurable.
5. Man will realize that one of the above is inevitable and will take steps to limit population before any one of them occurs.

There are two possibilities for limiting world population----
1) decreasing the birth rate
2) increasing the death rate

Is solving the population problem by voluntarily raising the death rate consistant with our modern social values and modern thinking? Most contemporary humanitarians and religious philosophies have a different view of the value of human life than that held in ancient times, when an individual life was considered relatively unimportant. Also, most efforts of modern medicine are designed to keep people alive.

The possbilities for increasing the death rate are through famine, thermonuclear war, virulent disease, or elimination of public health measures. It is universally accepted that increasing the death rate is an unpalatable solution to managing population size. Most attention has been focused on decreasing the birth rate. Before discussing controls on human population, it is interesting to note the population controls some animal populations have developed: weevils lay fewer eggs; guppies eat their young, mice lose their fertility; and more birds fail to get breeding territory. Human populations have external controls which include disease, war and starvation.

Making decisions about methods and policies to limit population is difficult and controversial. Below is a list of possibilities but keep in mind two important qualifications.

1) No one advocates all the alternatives--some are unrealistic and other repulsive
2) Some monetary incentives and tax revisions do not influence all segments of a population equally and perhaps tend to discriminate against the poor.

I. INCENTIVES

A. Intensified education campaigns at all levels to change present attitudes about the size of families. The educational program would develop social pressure for small families.

B. Encourage more women to engage in higher education or to enter the work force.

C. Provide for payment or a tax deduction for adoption fees for children who are particularly difficult to place, i.e. physically handicapped, older, and minority group children. This would reduce the cost to families who decide to adopt.

D. Equalize tax rates for single and married people. This would eliminate the monetary incentive for marriage.

E. Increase family planning laws.

F. Liberalize abortion clinics.

G. Voluntary sterilization with some incentive program.

H. Make birth control aids universally available at low cost.

I. Increase birth control research into reversible techniques and a male pill that has minimum side effects.

J. Provide prizes or cash incentive payment to those who use contraceptives or who do not have children for specified period.

K. Raise the average age of marriage through an incentive program. This proposal would reduce a woman's fertility years.

1. Alternative 1: If one marries early the marriage license would be very expensive. Slowly the costs of a license would be graduated with the age of the female until at age 30, the license would be free.

2. Alternative 2: End educational fellowships and loans for male married students including allowances for wives and children. This would encourage students to finish their education before getting married.

L. Establish a Department of Population and Environment with the mandate and the power to achieve a desired population level.

II. SANCTIONS

A. Introduce a system of taxation that would not reward parents for childbearing as the present system tends to do, but that would also not penalize the children from large families.

1. Presently a taxpayer receives a $750 deduction for every child.

2. Alternative 1: Only allow deductions for the first two children. Subsequent children would be no advantage in terms of income taxes.

3. Alternative 2: Graduated Deduction

$1500 - first child
$1000 - second child
$ 400 - third child
$ 0 - fourth and subsequent children

4. Alternatives 1 or 2 would not be retroactive and would apply to natural children only.

B. Develop a system of reverse taxation. Reverse taxation would apply only to those above a minimum income

First child add $600 to taxable income
Second child add $600 to taxable income
Third child, etc. add $1200 to taxable income

The tax would also be graduated according to income. The higher the income the larger the tax, since the rich cost society more especially in resource use.

This would make families pay for the extra services necessary for more than two children. A certain minimum income would be established so that the poor would not be starved by taxation.

C. Change welfare benefits to discourage rather than encourage childbearing. Federal Aid to Dependent Children Program allowances now provide more money to a family for each additional child. Thus some families can increase their gross income by having more children.

D. Place luxury taxes on baby accessories such as layettes, cribs, diapers, etc. This would make having children more expensive. The disadvantage of this method is that if affects poor and middle income families more than the rich.

E. Involuntary Sterilization

1. Compulsory sterilization after three children.

2. Addition of fertility control agents to the water supply for periods of time each year.

F. Provide a system of Baby Licenses

Give each child at birth 11 unit licenses. Upon marriage a couple would have 22 units. Each 10 units allows one legal child. It would be possible to accumulate through purchase and receiving gifts from unmarried or childless people to have more than two children. This would guarantee a stabilized population. (idea is from an article by Kenneth Boulding in College ed. Garrett Hardin) Reminder: Some proposals listed are unrealistic and repulsive. They are listed only because they are being considered (some are in legislative proposals) and should be discussed.

Procedure:

1. Be familiar with the Background Information.

2. Discuss some of the methods and policies to limit population.

3. Distribute Population Stabilization: How Close?

4. Ask them to make two lists. One of factors that should help us obtain population stabilization; the other a list of factors which are barriers to reaching stabilization.

5. Ask students

   a. Which trends appear to be strong forces in American Society?

   b. Which are the oldest?

   c. Which are the most likely to change?

   d. Which are least likely to change?

Population Stabilization: How Close? Worksheet

A population has stabilized when the number of births has come into balance with the number of deaths. And without the effects of immigration, the size of a stabilized population remains relatively constant. If U.S. families had, on the average, two children, we could reach population stabilization.

Of course, stabilization will not take place overnight. Large numbers of young people now entering their childbearing years add a "built-in" momentum to growth. Consequently our population will continue to grow for about 70 years.

It is important to understand the meaning of 'on the average' as it relates to family size. Many people do not marry, and some who do either are not able to have, or do not want children. On the other hand, a substantial number of couples have more than two children. As long as the differences balance out to two children, we can eventually reach population stabilization.

Many developments--some old some new--would indicate that stabilization of population in the U.S. is likely. In 1972 fertility reached a level equivalent of a 2-child completed family. On the other hand, we are experiencing other trends which might prevent us from sustaining this low fertility level long enough to reach stabilization.

Following is a list of these trends currently existing in the U.S. Some make population stabilization appear likely. Others indicate that reaching such a state of zero growth will be a difficult and slow process.

This nation has an ideological commitment to growth.

The technical quality of contraceptives has increased in the past ten years.

Youthful marriage is becoming less common.

The role of sex in human life and of reproductive process is often poorly understood.

In the United States in the 1930's the response to subreplacement fertility was anxiety over national prosperity, security, and virility.

Concern over the effects of population growth has been increasing.

Images of family life and the role of mother have been glorified in television programs.

A prominent theme in women's magazines has been 'child-saves-marriage.

The birthrate has declined over the last 10 years and showed a further decline in 1972.

There are restrictions on the availability of contraception, sex education and abortion.

There is a movement to expand women's options related to work and family roles.

During the period 1966-1970, 44 percent of all births were reported as unplanned, and 15 percent were reported as unwanted.

The family-size preferences of young people now entering child-bearing age are lower than those of the preceding generation.

The number of women in the reproductive age groups has increased sharply and by 1980, will be even greater.

00054

ACTIVITY 13: Review

Time Required: 1 period

Procedure: 1. Divide the class into small groups so each can consider one of the twelve questions listed below.

2. Allow time to share thoughts on the questions.

3. Have each question answered by a member of the group for the whole class.

Questions for Summary and Review

1. You are the head of state of a small republic with a population larger than its capacity to live within its boundaries. You are concerned and a commission is appointed to find practical solutions. You must list the variables you believe will affect population size in your instructions to the commission. What variables would you list?

Answer: Birth rate - fertility
Death rate - mortality
Life Expectancy
Generation time - age at which females bear children
Percent of women who bear children
Migration

2. What is the most important factor in projecting the future population of the United States?

Answer: Fertility

Mortality is constant and has little effect. Migration is no longer a significant contribution as it was in the late 19th and early 20th century.

3. What are the major factors underlying the present increase in United States population?

Answer: Low death rates
Family size 2 - 4 children
Universal marriage
Early age at marriage
Increase in the proportion of women in childbearing years

4. What are some of the reasons for a family bearing many children?

Answer: a. Expectation that some of the children would die at an early age - compensation for a high rate of death.
b. Form of security
1. economic support
2. companionship in old age.

c. Desire to have a son carry on the family name
d. Proof of masculinity or feminity
e. Procreation as recreation
f. Status

The economic incentives for childbearing have decreased with time. Psychological and social factors may actually have intensified.

5. How does the number of children affect the individual family?

Answer: a. Quality and Quantity of family's food and clothing
b. Housing
c. Chances for education, employment, and recreation
d. Relations between family members
e. Living standards and life style of family and country.

6. Is there a difference in family size in rural or urban areas?

Answer: A. Rural inhabitants of European countries have had higher levels of fertility than city residents for at least a century.
b. In the United States rural fertility is higher than urban although the differential has narrowed since 1940.
c. The demographic explanation seems to be the tendency of rural women to marry early and their practive of having children younger. Do we know why?

7. Historically, what are the principal methods of limiting family size?

Answer: a. Death of infants.
b. Death of children from malnutrition and disease.
c. Many societies have customs to limit family size:
1. Marrying at an older age (perhaps after 30)
2. Requirements that some groups never marry (priests and nuns)
3. Separating sexes at specified times or a taboo on sex relations between various persons.
4. Preconditional marriage, e.g. ownership of land
d. In some societies - infanticide and/or abortion
e. Contraception.

In addition to the problems discussed, the future promises to present us with a whole series of problems which require international cooperation. As the world continues to become more and more interdependent, difficulties in one area will likely affect the entire globe, particularly where violence is the outcome. This section considers only some of the more obvious problems to be confronted. The following questions should highlight the kinds of problems which will confront rich and poor countries over the next two or three decades.

00056

Questions:

1. Increasing and sharing food production

   a. Will the rich countries be willing to share with the poor? Can the poor afford to buy?
   b. What consequences might increased food production have on environmental problems?
   c. What kinds of food will become the dominant sources of nourishment? (artificial proteins, soybean flour?)

2. Controlling pollution and dangerous chemicals

   a. Does pollution respect national boundaries? (oil spills, DDT, air pollution, nuclear fallout)
   b. Who is to be held responsible for changes in the weather?

3. Using the oceans

   Who has a right to the mineral resources under the ocean floor?

4. Maintaining peace and security

   a. Will starvation and crowding lead to violence and war?
   b. Who has a right to limited resources? Who decides?
   c. Can international organizations be created to handle these problems?

5. What is your position on foreign aid? Pro's and Con's of such programs. Are you your "brother's keeper"? How should foreign aid programs be related to population growth, if at all?

00057

A P P E N D I X

Population Unit Test
Answer Sheet
Test Key
Pre-Post Test Tally Sheet
Student Evaluation
Student Evaluation Tally Sheet
Teacher Evaluation

ACTIVITY 14: Post Test

Time Required: ½ period

Purpose: To determine the effectiveness of the unit and the environmental awareness of the students when the post test score is compared with the pre-test.

Materials Needed:

1. Post test.
2. Answer Sheet.

Procedure:

1. Distribute the answer sheets.
2. Distribute the post test to each student and instruct them to write on the answer sheet.
3. Allow 20 - 30 minutes for testing.
4. Collect post test and answer sheets.
5. Record the number the student got correct on the tally sheet.
6. Return completed tally sheet to Environmental Education Office after all post test scores are recorded.

00059

Population Unit Test
Twelfth Grade Sociology
Environmental Education Unit

Directions: Select the best answer that completes the sentence. DO NOT WRITE OR MARK ON THE TEST. Place all answers on the separate answer sheet.

PART I.

1. The Commission on Population Growth and the American Future (CPGAF) agreed that all Americans must be enabled to bring only wanted children into the world. To this end, it recommended all of the following except

   a. abortion as a primary means of birth control.
   b. contrapcetive information and services for adults and minors.
   c. greater national investment in research for better methods of fertility control.
   d. expansion of federally subsidized family planning programs.

2. United States immigration has

   a. reduced the labor market
   b. increased since 1911
   c. been eliminated since 1911
   d. declined since 1911

3. The replacement of population function of a society

   a. can occur only through sexual reproduction.
   b. occurs primarily through reproduction.
   c. refers to the recruitment of new members to the society.
   d. provides women with a social role.

4. Population density refers to

   a. the number of people in urban areas.
   b. the biological quality of a population.
   c. the total numbers of people.
   d. the number of persons per square mile of land.

5. Even if global agreement were reached today that population stabilization is preferable to growth and even if a safe, effective and accepted method of reducing fertility were discovered tomorrow the world's population would

   a. stabilize immediately.
   b. decline substantially
   c. increase for some 60 years

6. All of the following are aspects of the population change in the United States except

   a. lopsided increase in certain age groups
   b. too rapid a growth of population
   c. even population distribution
   d. families burdened with too many children

7. Nowadays most Americans move from

   a. economically depressed rural areas
   b. one metropolitan area to another
   c. suburbs to center city
   d. center city to farm

8. Population growth depends on

   a. climatic conditions
   b. political factors
   c. strong sex drive
   d. an excess of live births over deaths

9. The population of countries such as India, China, Brazil and parts of Africa may be characterized as

   a. high growth potential
   b. transitional
   c. highly mobile
   d. migratory

10. Migration

   a. is a permanent panacea for population pressures in the sending country.
   b. relieves population pressure only temporarily in the sending country, if the birth rate remains constant.
   c. permanently lowers the standard of living in receiving countries.
   d. usually involves migration from low death rate areas to high death rate areas.
   e. is entirely instinctive, as evidenced by the junco and the salmon.

11. When studying population growth figures it should be noted that

   a. growth has been uniform.
   b. industrialized countries are leading the population expansion.
   c. not only has population increased so has its rate of growth.
   d. none of the above.

12. The population of the world today is about

   a. 900 million
   b. 2 billion
   c. 4 billion
   d. 750 million

13. What is the present rate of growth of world population?

   a. 1 percent
   b. 2 percent
   c. 5 percent
   d. 10 percent

14. If world Population continues its present rate of growth, how long will it take to double?

   a. 10 years or less
   b. approximately 20 years
   c. approximately 35 years
   d. approximately 85 years
   e. approximately 120 years

00061

15. What is the population of the United States today?

a. under 50 million
b. about 75 million
c. about 110 million
d. about 210 million
e. over 5000 million

16. If the U. S. population continues to grow at its present rate, how long will it take to double?

a. 10 years or less
b. approximately 20 years
c. approximately 35 years
d. approximately 85 years
e. approximately 120 years.

17. Which of the following countries has the greatest number of people?

a. China
b. India
c. United States
d. Soviet Union
e. Brazil

18. Which of the following countries has the fastest growing population?

a. Soviet Union
b. United States
c. Mexico
d. West Germany
e. India

19. In the less developed countries....

a. birth rates are high
b. death rates are high
c. literacy rates are high
d. per capitia income is high
e. population growth rates are low

20. Which has NOT been a major cause of the population explosion:

a. modern preventive medicine
b. increase in birth rates
c. improved sanitation
d. lower infant mortality
e. longer life span

00062

Part II. WHAT IS YOUR OPINION?

For each statement below, place a check mark in the space which indicates your response. There are five possible responses:

SA - strongly agree
A - agree
N - neutral
D - disagree
SD - strongly disagree

		SA	A	N	D	SD
1.	The growth of world population is a serious problem.					
2.	The growth of the United States population is a serious problem.					
3.	Population growth causes other economic and social problems to be worse.					
4.	Population growth is more serious than pollution.					
5.	The U.S. high standard of living may eventually decline because of too many people.					
6.	Population growth has a significant effect on our energy reserves.					
7.	Freedom and individual rights are threatened by overcrowding.					
8.	Population distribution is a more serious problem than population growth.					
9.	To control population, tax exemption should be provided for only two children.					
10.	If underdeveloped countries do not control their population growth, the U.S. should cut off their foreign aid.					
11.	The U.S. should put more money and effort into research for new, safe and effective birth control methods.					
12.	The government should set up birth control clinics and provide contraceptives to anyone who requests them.					
13.	After two illegitimate births a woman should be sterilized.					

00063

Population Unit Answer Sheet
Twelfth Grade Sociology
Environmental Education

PART I.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

PART II.

	SA	A	N	D	SD
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					

00064

Population Unit Test Key
Twelfth Grade Sociology
Enivironmental Education

PART I:

1. a
2. d
3. b
4. d
5. c
6. c
7. b
8. d
9. a
10. b
11. c
12. c
13. b
14. c
15. d
16. d
17. a
18. c
19. a
20. b

00065

Population Unit Tally Sheet
Twelfth Grade Sociology

SCHOOL _____ TEACHER _____

Number of Students in Class _____ DATE _____

Student's Name	Pre-Test Score	Post Test Score	Do Not Write In This Column
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

00066

ACTIVITY 15 Student Evaluation

Time Required: ½ period

Purpose:

1. To give students an opportunity to express their likes and dislikes concerning the unit.

2. To give teachers an opportunity to inform the Environmental Education staff of what works and what needs revising.

Procedure:

1. Distribute the Student Evaluation sheet to each student.

2. Have the student respond to each question and return the papers to you.

3. Record each response on the student evalution tally sheet and return this sheet to the Environmental Education staff.

4. Complete the Teacher Evaluation and return to Environmental Education office.

00067

SCHOOL _____ TEACHER _____ DATE _____

STUDENT EVALUATION
ENVIRONMENTAL EDUCATION UNIT
TWELFTH GRADE SOCIOLOGY
POPULATION UNIT

A. Overall Program	YES	NO
1. Did you enjoy studying this unit?	___	___
2. Do you feel that the unit was worthwhile?	___	___
3. Do you feel that you now know more about your environment and its problems than you did before studying this unit?	___	___
4. Did it increase your desire to want to help in trying to improve the quality of life for all?	___	___
5. Did you learn about some actual ways that you can help in improving life's quality?	___	___

B. Activities - To what extent did you find the following activities interesting?

	Very Interesting	Interesting	Dull
1. Each of Us A Population Actor	___	___	___
2. Spaceship Earth	___	___	___
3. Where Do The Children Play	___	___	___
4. Dimensions of the World Food Crisis	___	___	___
5. Survey: Marriage and Childbearing	___	___	___
6. Parental Survey	___	___	___
7. Green Revolution	___	___	___
8. Food From The Sea Theory	___	___	___
9. Human Reproduction	___	___	___
10. Population Stabilization: How Close?	___	___	___

C. Classroom Materials	Very Helpful	Helpful	Little Or no Help
1. Population and the American Future film	___	___	___
2. Population and the American Future Booklet	___	___	___
3. Economy versus Ecology filmstrip	___	___	___

00068

School _____ Teacher _____ _____ Date _____

Tally Sheet for Student Evaluation - Twelfth Grade

Question	Student Response Yes	No
A.		
1.	____	____
2.	____	____
3.	____	____
4.	____	____
5.	____	____

	Very Interesting	Interesting	Dull
B.			
1.	____	____	____
2.	____	____	____
3.	____	____	____
4.	____	____	____
5.	____	____	____
6.	____	____	____
7.	____	____	____
8.	____	____	____
9.	____	____	____
10.	____	____	____

	Very Helpful	Helpful	Little or No Help
C.			
1.	____	____	____
2.	____	____	____
3.	____	____	____

Name _____ School _____

TEACHER EVALUATION
ENVIRONMENTAL EDUCATION UNIT
TWELFTH GRADE SOCIOLOGY

A. Overall Program	YES	NO
1. Do you feel that the unit was effective in your class?	___	___
2. Did the activities used in the unit adequately cover the major concepts?	___	___
3. Were the objectives relevant to the concepts and the activities in the unit?	___	___
4. Were the objectives realistic?	___	___
5. Do you feel that most of these objectives were achieved in your class?	___	___
6. Was the material used relevant to the student and his local environment?	___	___
7. Did you have enough time for the unit?	___	___
8. Omitting the time factor, was the schedule easy to follow?	___	___
9. Were the resource materials provided adequate?	___	___
10. Were your classroom facilities adequate for the activities used?	___	___
11. Was the teacher's guide adequate?	___	___
12. Did you receive adequate assistance from the Project Staff?	___	___
13. Do you feel that your students have become more aware of their environment and its problems?	___	___
14. Can you see any carry over into the student's activities outside the classroom?	___	___
15. Has there been any carry over in other subjects that you teach or that the student's have?	___	___
16. Do you feel that this unit should be continued next year?	___	___

B. Effectiveness of Program Components:
Please rate the effectiveness of the following components.

	Very Good	Good	Fair	Poor
1. Population and the American Future Film	___	___	___	___
2. Population and the American Future Booklet	___	___	___	___
3. Each of Us: A Population Actor	___	___	___	___
4. Spaceship Earth	___	___	___	___
5. Where Do the Children Play	___	___	___	___

00070